



## ABSTRAK

### **Profil Limfosit T CD4+ dan CD8+ sebagai Biomarker Penuaan pada Pasien Neuritis Optik**

Aufaa Shafira Widowati<sup>1</sup>, Indra Tri Mahayana<sup>1</sup>, Dhimas Hari Sakti<sup>1</sup>

1. Departemen Ilmu Kesehatan Mata, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan, Universitas Gadjah Mada-RSUP Dr. Sardjito, Yogyakarta

#### **Latar Belakang**

Neuritis optik merupakan kondisi inflamasi pada nervus optik. Sel T CD4<sup>+</sup> dan CD8<sup>+</sup> terlibat sebagai sel imun utama penghasil sitokin pro-inflamasi dan menjadi sel sitotoksik, menyebabkan lisis pada oligodendrosit dan berakhir pada demyelinisasi neuron. Subtipe limfosit tersebut juga berperan dalam proses penuaan SSP melalui peningkatan inflamasi basal. Penelitian ini bertujuan menilai perbedaan kadar sel T CD4<sup>+</sup> dan CD8<sup>+</sup> pada pasien neuritis optik dibanding dengan populasi sehat dan hubungannya dengan penuaan.

#### **Metode**

Penelitian dengan desain potong-lintang ini melibatkan 21 pasien berusia dewasa yang terdiagnosis neuritis optik onset akut, memenuhi kriteria inklusi, dan belum mendapat terapi steroid intravena. Sebagai pembanding, diambil 21 sukarelawan sehat yang dicocokkan usia dan jenis kelaminnya dengan pasien. Sampel darah perifer diambil untuk pemeriksaan darah rutin dan pengukuran kadar sel T CD4<sup>+</sup> dan CD8<sup>+</sup>. Selain itu, dilakukan penilaian terhadap tajam penglihatan terkoreksi terbaik, pemeriksaan lapang pandang, kontras, dan pemeriksaan OCT.

#### **Hasil**

Kadar sel T CD4<sup>+</sup> dan CD8<sup>+</sup> lebih tinggi pada pasien neuritis optik dibandingkan kontrol sehat. Persentase sel T CD4<sup>+</sup> sebesar  $31,67 \pm 9,20\%$ , sedangkan pada kontrol sehat  $30,99 \pm 8,10\%$  ( $\Delta 0,68 \pm 11,84$ ,  $P = 0,768$ ). Kadar absolut sel T CD4<sup>+</sup>  $827,02 \pm 340,89$  sel/ $\mu$ L, sedangkan pada kontrol sehat  $744,24 \pm 268,59$  sel/ $\mu$ L ( $\Delta 82,78 \pm 338,79$ ,  $P = 0,071$ ). Persentase sel T CD8<sup>+</sup> sebesar  $27,20 \pm 8,51\%$ , sedangkan pada kontrol sehat  $28,30 \pm 9,10\%$  ( $\Delta -1,09 \pm 11,80\%$ ,  $P = 0,654$ ). Kadar absolut sel T CD8<sup>+</sup>  $698,98 \pm 273,49$  sel/ $\mu$ L, sedangkan pada kontrol sehat  $674,07 \pm 245,95$  sel/ $\mu$ L ( $\Delta 24,91 \pm 426,79$ ,  $P = 0,122$ ). Usia memiliki hubungan yang bermakna dengan persentase CD4<sup>+</sup> (CI 95% 0,080-0,437,  $P = 0,006$ ), kadar absolut sel T CD4<sup>+</sup> (CI 95% 0,536-13,697,  $P = 0,035$ ), dan rasio CD4<sup>+</sup>/CD8<sup>+</sup> (CI 95% 0,007-0,033,  $P = 0,004$ ).

#### **Kesimpulan**

Terdapat peningkatan kadar sel T CD4<sup>+</sup> dan CD8<sup>+</sup> yang tidak signifikan pada pasien neuritis optik dibanding kontrol sehat. Peningkatan usia berhubungan dengan persentase sel T CD4<sup>+</sup> dan rasio sel T CD4<sup>+</sup>/CD8<sup>+</sup> pada pasien neuritis optik.

#### **Kata Kunci**

Neuritis optik, limfosit, CD4<sup>+</sup>, CD8<sup>+</sup>

## ABSTRACT

### **Profile of CD4<sup>+</sup> and CD8<sup>+</sup> T-Lymphocytes as the Aging Biomarkers in Optic Neuritis Patients**

Aufaa Shafira Widowati<sup>1</sup>, Indra Tri Mahayana<sup>1</sup>, Dhimas Hari Sakti<sup>1</sup>

1. Ophthalmology Department, Faculty of Medicine, Public Health, and Nursing,  
Universitas Gadjah Mada-Dr. Sardjito General Hospital, Yogyakarta

#### **Background**

Optic neuritis is an inflammatory condition of the optic nerve. CD4<sup>+</sup> and CD8<sup>+</sup> T-lymphocytes drive the inflammation through production of pro-inflammatory cytokines and differentiation into cytotoxic cell, inducing lysis of oligodendrocyte and demyelination of neurons. These lymphocytes also take part in the aging of central nervous system through elevation of basal inflammation level. This study aims to compare CD4<sup>+</sup> and CD8<sup>+</sup> levels between acute optic neuritis patients and healthy controls, and their correlations to aging.

#### **Methods**

Twenty-one newly-diagnosed acute optic neuritis patients who fulfilled the inclusion criteria and had not received intravenous steroid treatment were included in this cross-sectional study. Twenty-one age- and sex-matched healthy volunteers served as the control group. Peripheral blood samples were collected from all subjects for routine blood examination and measurement of CD4<sup>+</sup> and CD8<sup>+</sup> levels using flow cytometry. Best-corrected visual acuity, visual field analysis, contrast sensitivity, and OCT were examined in each patient.

#### **Results**

The levels of CD4<sup>+</sup> and CD8<sup>+</sup> T-lymphocytes is higher in optic neuritis patients. CD4<sup>+</sup> percentage was 31,67±9,20%, while the percentage in the healthy controls was 30,99±8,10% ( $\Delta$  0,68±11,84,  $P = 0,768$ ). Absolute CD4<sup>+</sup> count was 827,02±340,89 cells/ $\mu$ L and 744,24±268,59 cells/ $\mu$ L in healthy controls. ( $\Delta$  82,78±338,79,  $P = 0,071$ ). The percentage of CD8<sup>+</sup> T-lymphocytes in optic neuritis patients was 27,20±8,51% and 28,30±9,10% in healthy controls ( $\Delta$  -1,09±11,80%,  $P = 0,654$ ). Absolute CD8<sup>+</sup> count was 698,98±273,49 cells/ $\mu$ L, and 674,07 ± 245,95 cells/ $\mu$ L in healthy controls ( $\Delta$  24,91 ± 426,79,  $P = 0,122$ ). Age has a significant and positive correlation with CD4<sup>+</sup> percentage (95% CI 0,080-0,437,  $P = 0,006$ ), absolute CD4<sup>+</sup> count (95% CI 0,536-13,697,  $P = 0,035$ ), and CD4<sup>+</sup>/CD8<sup>+</sup> ratio (95% CI 0,007-0,033,  $P = 0,004$ ).

#### **Conclusion**

The levels of CD4<sup>+</sup> and CD8<sup>+</sup> T-lymphocytes are higher in optic neuritis patients, but the difference is statistically insignificant. Age is correlated with the percentage of CD4<sup>+</sup> T-lymphocytes and CD4<sup>+</sup>/CD8<sup>+</sup> ratio in optic neuritis patients.

#### **Keywords**

Optic neuritis, lymphocyte, CD4<sup>+</sup>, CD8<sup>+</sup>